Journal of Environmental Biology
p-ISSN: 0254-8704 • e-ISSN: 2394-0379 • CODEN: JEBIDP

JEB®

Original Research Paper
Volume 47 Issue 2 March 2026 pp. 423-429
DOI: http://doi.org/10.22438/jeb/47/2(SI)/SI-01

J. Environ. Biol., 2026

Journal website : www.jeb.co.in ★ E-mail : editor@jeb.co.in

Integrating ESG principles in India's construction sector: A comprehensive assessment

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Received: 24 October 2025 **Revised:** 06 November 2025 **Accepted:** 28 February 2026

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Abstract

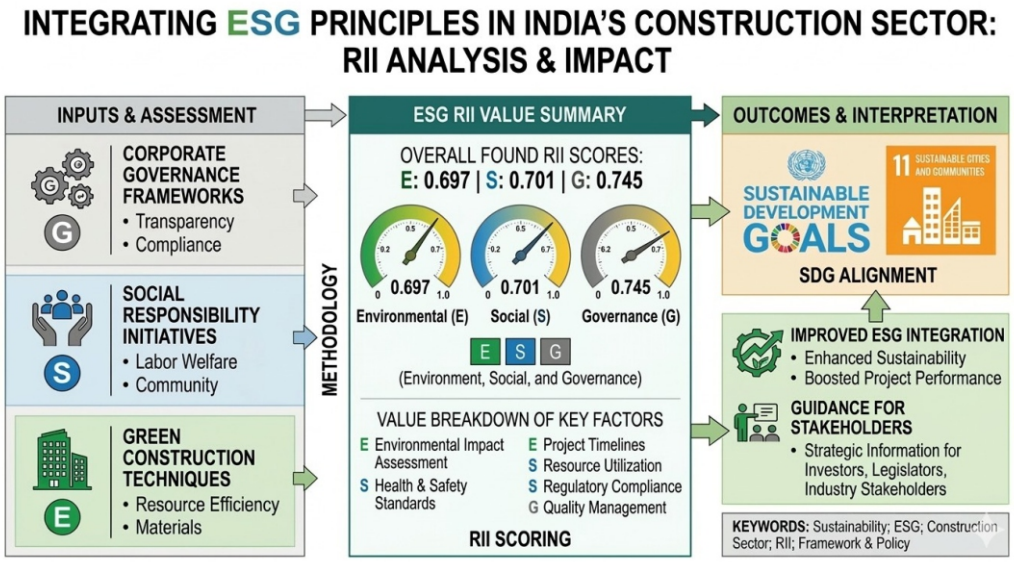
Aim: The given research explores the integration of Environmental, Social, and Governance (ESG) principles within India's construction sector, highlighting their influence on sustainability, project performance, and governance structures. The necessity for ESG adoption has been highlighted in recent years by the global shift toward sustainable business practices, especially in high-impact sectors like construction.

Methodology: Through an analysis of corporate governance frameworks, social responsibility initiatives, and environmentally friendly construction techniques, this study assesses the degree to which Indian construction companies have adopted ESG.

Results: To give a thorough grasp of the importance of ESG factors in the industry, the analysis ranks them using the Relative Importance Index (RII) technique. To visually compare ESG aspects across different categories, the study also makes use of a variety of visualizations.

Interpretation: This study points out the weaknesses in current frameworks and suggest ways to improve ESG integration in order to meet the Sustainable Development Goals (SDGs). This study advances sustainable construction practices in India by providing information to investors, legislators, and industry stakeholders. The results of the study relate the importance of ESG component by means of RII. It was interpreted how different factors among ESG are valued in the construction industry.

Key words: Construction Sector, ESG, Framework, Policy, Principles, Sustainability



How to cite: Abhyankar, A.A., J.S. Sudarsan and V. Balon: Integrating ESG principles in India's construction sector: A comprehensive assessment. *J. Environ. Biol.*, **47,** 423-429 (2026).

Introduction

In recent years, there is huge increase in the construction sector and also industrial growth, which impacts the environment as large number of lands and necessary resources are needed. Today we need environment friendly framework in the construction sector to achieve sustainability. Environmental, Social, and Governance (ESG) is a comprehensive framework. that aligns with the environment social and governance dimensions. Environmental dimension includes carbon footprint, resource conservation, waste management water, footprint, energy footprint etc. While social dimensions include society aspect, labour welfare, employee engagement, community development, data and security etc. In Governance dimension it will be about board structure, diversity, inclusion, stakeholder management, employee engagement etc. (Zhang, 2019). If all these three are performing well for any kind of construction firm then the brand value reputation transparency accountability will be higher in these firms (Rankin, 2008).

The construction sector needs to maintain a balance between environmental sustainability and economic development to transit into a sustainable enterprise (Siew, 2017). In addition to making a substantial contribution to GDP and employment worldwide, the construction sector is also responsible for high greenhouse gas emissions, resource consumption, and social problems like unsafe working conditions and exploitation of workers. In India, the major problems are arising due to rapid urbanization, which ultimately leads to the requirement of houses and infrastructure. Management is failing due to improper integration of ESG principles. As outlined in the United Nations' Sustainable Development Goals (SDGs), ESG framework provides a unified way to align how a building operates with the world's sustainability objectives (Darko *et al.,* 2017). This alignment includes focusing on efficient use of resources, low environmental impact, employee welfare, and open processes for governance (Häkkinen *et al.,* 2011; Kumar, 2015; Rezaee, 2016 Javed *et al.,* 2018).

In the construction, Real Estate and Infrastructure sector (CRIS), it is important to give more emphasis on ESG because the sector is creating high impact on the environment, this sector is highly unorganised, and the social aspects of different stakeholders are diverse (Gu *et al.,* 2025). But if the process involves integrating the activities of projects with ESG in the CRIS industry, then it will promote Sustainability in the projects. It will help to integrate the projects with SDGs. Many indirect and long-term benefits are transparency, reduction in malpractices, and financial irregularity, value among the stakeholders will increase, value of the organisation at the global and regional level will increase, resource conservation and effective resource management is possible, overall it improves the profit and leads to sustainable business. The purpose of this study was to examine the impact of ESG integration in the Indian construction industry, pinpoint the current barriers and to suggest well and effective solutions to promote its uptake.

Materials and Methods

A survey was conducted among different stakeholders (Managers, Engineers, Site Supervisors) of Construction sector. Total 155 responses were collected from different construction sectors based in India. The analysis conducted using different methodologies. The questionnaires included Environmental, Social and Governance parameters Limitations were examined, and ethical issues were collected at each step of the study. The overall interest to find the ESG aspects which are more significant, RII analysis was used. This index helped in determining rank of each parameter in ESG and accordingly the prioritization was done. The RII helped in assessing all the sectors the ESG can be good in construction sector and where it is lagging behind. Several parameters were floated through questionnaire survey and accordingly the responses of respondents' were collected. Likert scale ranging from strongly agree to strongly disagree was used and furthermore, the frequency analysis was performed and interpretations was carried out. This study would help the construction sector to excel more and make significant growth. Recommendations were proposed for further enhancement in making ESG a benchmark to grow higher in all aspects. The study was conducted through a structured survey, with respondents evaluating various ESG-related statements on a Likert scale. The chief analytical tool of the study for data gathering was the Relative Importance Index (RII). The relative performance of the construction industry was ranked by RII for the Environmental, Social, and Governance (ESG) factors.

This method allows ranking based on perceived performance or relevance, hence, it is highly effective for garnering meaningful information from Likert-scale responses. Through aggregating and consolidating the responses, the RII values were established to allow the comparison across three dimensions. The research aimed to provide a firm foundation for understanding the interplay of environmental, social, and governance factors within the construction sector, focusing on the Indian context, by adopting this systematic and multi-faceted approach. The RII formula was as follows:

$$RII = \frac{\sum W}{A \times N}$$

Where, W is the weight given to each factor by the respondents; A is the highest possible weight, and N is the total number of respondents. A radar chart was used to provide a graphical representation of the ESG performance, facilitating comparison between different dimensions.

Table 1: Descriptive summary for Environmental, Social and Governance parameters from 155 respondents

Parameters	Environmental	Social	Governance
Mean	3.485	3.506	3.723
Standard Error	0.048	0.046	0.05
Median	3.625	3.625	3.75
Mode	3.75	3.625	3.75
Standard Deviation	0.597	0.576	0.624
Sample Variance	0.357	0.332	0.389
Kurtosis	0.736	0.934	0.949
Skewness	0.523	-0.111	-0.225
Range	3	3	3
Minimum	2	2	2
Maximum	5	5	5
Sum	540.12	543.5	577
Count	155	155	155

Results and Discussion

Table 1 depicts descriptive summary for E, S and G parameters from 155 respondents. The mean, median and mode of environmental and social parameters were similar compared to Governance parameters. However, the data was not normally distributed as Skewness was not close to zero. Fig. 1 illustrates the percentage contribution of the ESG parameters. Environmental, Social and Governance Performance accounted for equal proportion, *i.e.,* 33.3% each. This distribution reinforces equal contribution of E, S and G in the construction sector. The balanced proportions among the three parameters suggest a holistic approach to ESG integration (Fig. 2). The given chart illustrates the average scores for three ESG performance parameters-Environmental, Social, and Governance. Fig. 2 shows that the Governance Performance parameter had the highest average score (3.72), followed closely by Social Performance (3.506) and Environmental Performance (3.485). Although the differences were minimal, which indicates that Governance Performance is prioritized slightly more than the other two in the construction sector, possibly due to high regulatory and compliance demands of the sector. Social and Environmental Performance scores were nearly identical, suggesting that while environmental practices and social responsibility are valued, they may require additional attention to fully align with governance standards. The average scores of three ESG (Environmental, Social, and Governance) performance parameters indicate that Governance Performance had a slight edge over Social and Environmental Performance in terms of priority within the construction sector.

Environmental Performance, although a notch below Governance and Social Performance, remains a priority for the construction industry. With the industry's immense environmental impact through the usage of resources, energy consumption, and the production of wastes, there is a need for green practice (Gupta, 2012; Ramesh *et al.,* 2010). This encompasses the use of sustainable building materials, waste reduction, and increased efficiency of energy usage. Despite the Environmental score being slightly lower, the construction industry is increasingly recognizing that environmental stewardship is essential for its sustainability. This change probably indicates the industry's intent to meet national and international environmental standards, including the reduction of carbon emissions and preservation of natural resources. Overall, while Governance Performance has emerged as the leading priority, the close scores across all three parameters (E,S,G) indicate a balanced approach within the business towards ESG principles. Infrastructure companies are in more harmony with the interconnected nature of governance and environmental sustainability. To further progress in these areas, the industry should focus on refining governance frameworks to encompass environmental and social goals, promoting a holistic ESG strategy that meets SEBI regulatory demands while enhancing CSR Corporate Social responsibility, which would eventually lead to sustainability. The detail analysis of E, S, and G parameters is given below:

Environmental performance in the construction sector emphasizes on reducing the negative ecological impacts through sustainable resource management, energy efficiency, and waste reduction practices (Sharma and Chani, 2024). According to Fig. 3, the key areas include adopting eco-friendly materials, implementing energy-saving techniques, and reducing greenhouse gas emissions across construction activities. In order to encourage resource-efficient designs and sustainable construction methods, businesses are urged to incorporate green building standards like LEED or IGBC compliance (Du Plessis, 2007; Kibert, 2016). Long-term resource conservation and carbon footprint reduction are facilitated by the effective environmental performance of sector, which also supports regulatory compliance and global sustainability goals.

Environmental performance in the construction sector reveals that Cost and Time Savings (3.54) is the top-performing factor in environmental performance, followed closely by Emissions and Efficiency (3.52) and Project Performance (3.51), indicating that efficient resource management and project execution contribute significantly to sustainability. Sustainability Satisfaction (3.49) and Eco-Friendly Methods (3.48) show moderate effectiveness, suggesting these areas are on track but could benefit from further enhancement. Lower scores in Resource Depletion (3.46), Transparency in Sustainability (3.44), and Sustainability Priority (3.43) highlight areas for improvement; specifically, more emphasis on sustainable resource use, transparent reporting, and integrating sustainability as a core organizational priority could strengthen environmental outcomes (Fig. 4). To address these gaps, the study recommends reinforcing resource management practices, increasing transparency in sustainability efforts, and prioritize sustainability

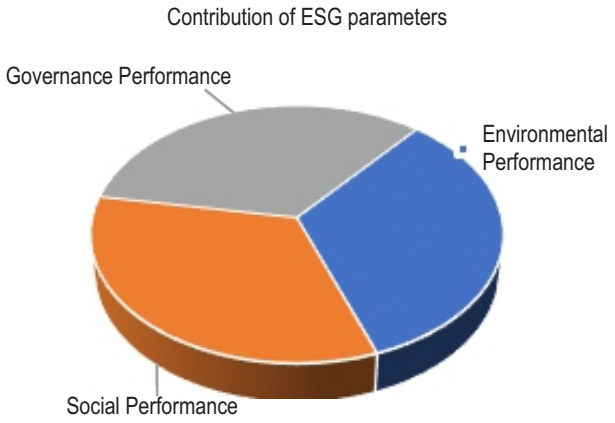


Fig. 1: ESG contribution in the Construction Sector.

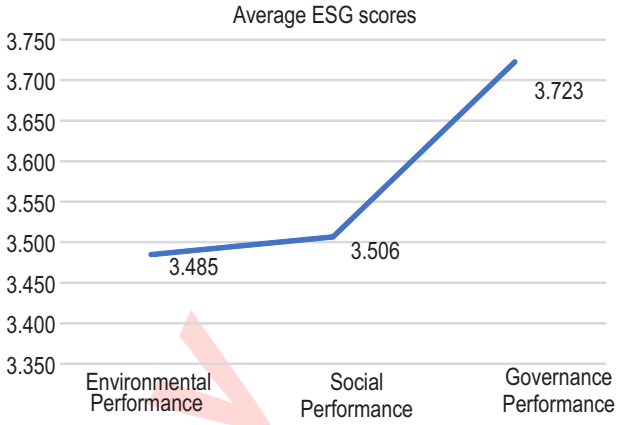


Fig. 2: Average ESG scores in Construction Sector.

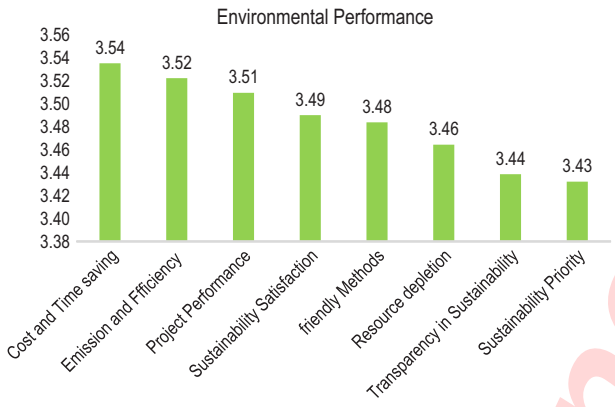


Fig. 3: Environmental performances in the Construction Sector.

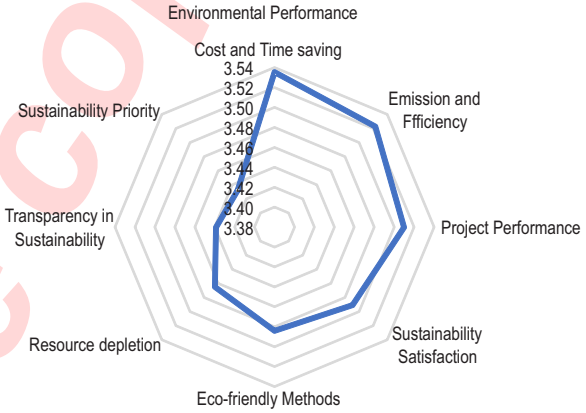


Fig. 4: Radar chart-Environmental performance in the Construction Sector.

in strategic decision-making processes. In the construction industry, social performance (S) is centered on community involvement, workforce diversity, and the welfare and equitable treatment of workers. This entails establishing secure working environments, encouraging inclusivity and diversity, and guaranteeing equitable compensation and moral labour standards. Socially conscious building methods assist the industry to achieve legal requirements and wider social expectations by fostering trust with the community and enhancing business reputation (Fig. 5).

In the social performance, the average score of Stakeholder Engagement (3.63) emerges as the most significant factor. Social Responsibility (3.61) Partnerships and Collaborations (3.54) also perform well, highlighting the positive impact of ethical practices and cooperative efforts. Workforce Diversity (3.52) is moderately effective, indicating the value placed on diverse, inclusive work environments (Fig. 7). However, lower score for Worker Safety (3.50), Leadership Inclusivity (3.45), Community Involvement (3.42), especially Fair Labour Practices (3.37) point toward areas that need improvement (Fig. 6). The paper suggests enhancing worker safety protocols, strengthening inclusive leadership, fostering community engagement, and prioritizing fair labour practices to improve the social performance further. Governance performance (G) in construction is centred on strong corporate governance structures, transparency, and compliance with legal standards. This includes implementing effective risk management practices, maintaining accountability, and ensuring ethical conduct within all levels of the organization. Good governance practices reduce the risk of legal and financial repercussions while enhancing investor confidence and operational resilience. In the construction sector, this often translates into clear governance frameworks for project management, subcontractor relationships, and stakeholder engagement, which together help maintain high standards and build credibility within the industry (Fig. 7). Research indicates that sustainability practices enhance financial performance alongside environmental outcomes (Siew *et al.,* 2013; Reddy *et al.,* 2024). A comparative study emphasizes the need for context-

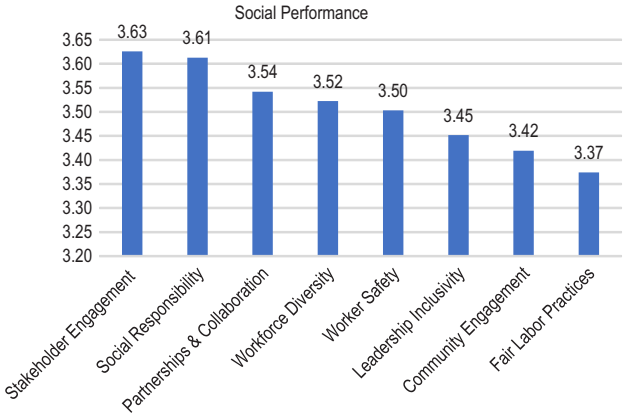


Fig. 5: Social performance in the Construction Sector.

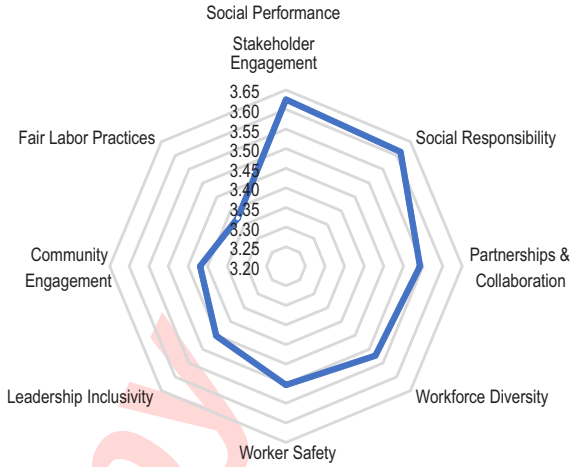


Fig. 6: Radar chart-Social performance in the Construction Sector.

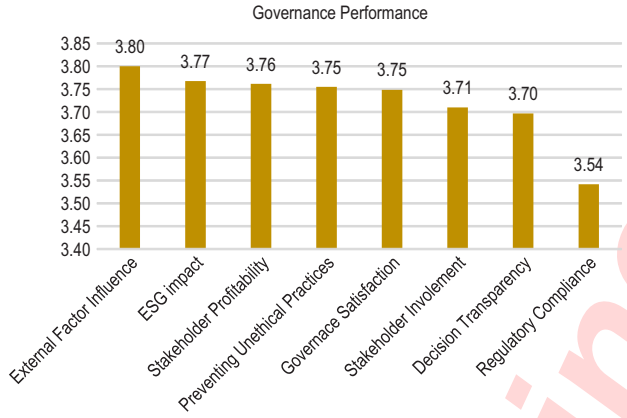


Fig. 7: Governance performance in the Construction Sector.

Fig. 8: Radar chart-Governance performance in Construction Sector.

specific ESG strategies to ensure effective implementation in developing countries like India (Singh, 2014).

In the case of Governance performance, the average score of External Factors Influence (3.80) is identified as the highest-ranking factor, underscoring the significance of adapting to external pressures, such as economic, social and political influences, in achieving robust governance. ESG Impact (3.77) and Stakeholder Profitability (3.76) are also key contributors, suggesting that sustainable governance practices and profitability are well-aligned. Preventing Unethical Practices and Governance Satisfaction (both with 3.75) are moderately effective, indicating a satisfactory level of ethical compliance and governance quality. However, lower scores in Stakeholder Involvement (3.71), Decision Transparency (3.70), and Regulatory Compliance (3.54) reveal areas that require improvement (Fig. 8). To address these gaps, the study recommends enhancing stakeholder engagement mechanisms, improving transparency in decision-making processes, and ensuring strict adherence to regulatory standards to strengthen the overall governance performance. The Relative Index score (RII) for Environment (E), Social (S), and Governance (G) was 0.697, 0.701 and 0.745.

The RII scores for E, S and G were almost same and close to 1, which indicated that all the three, *i.e.*, E, S and G were equally adopted by the Indian Construction companies. These research findings contradict several studies, where ESG adoption is skewed toward environmental factors due to regulatory and investor pressure (Eccles *et al.,* 2014; Li *et al.,* 2019). The study contributes by developing a structured, quantifiable framework (Sharma and Gupta, 2022). By integrating both RII and descriptive analysis, the research moves provide evidence-based understandings into ESG alignment in Indian

Construction Industry which is most resource-intensive. This empirical approach helps bridge a critical knowledge gap in ESG discourse. Adopting ESG practices under the People, Planet, and Profit framework enables Indian construction companies to pursue a balanced path toward profitability.

As the industry continues to evolve, prioritizing these principles will empower companies to meet both financial and social demands effectively. By aligning with SDGs and engaging in proactive ESG strategies, the construction sector can make strides toward a future where economic success complements both social and environmental well-being. This research finding points towards the need for a holistic response to sustainability in India's construction sector, with the role of ESG practices being central. The research points towards an existing focus on governance, driven probably by regulatory compliance and risk, but also points towards areas in the environmental and social domains where there is a lot of scope for improvement towards a balanced ESG framework.

The environmental aspect, which currently lags slightly can be improved by implementing stronger environmental laws and policies, the construction industry can contribute to becoming resilient planet. To further strengthen ESG integration, increasing Regulatory Compliance in Governance is essential. The construction companies should adopt circular economy principles more efficiently to become more sustainable in the long run. With these improvements, the sector will not only meet current regulatory demands but also position itself as a leader in sustainable practices, driving impactful changes that support both people and the planet (Agyekum-Mensah *et al.,* 2012).

Based on the research findings, it can be concluded that the study helps the policy makers, business executives, and other interested parties, to develop uniform, stronger ESG framework exclusively for Indian construction sector. This study supports a sustainable and equitable construction industry, enhancing its role in forming a resilient and sustainable future for India by addressing environmental impacts, encouraging social inclusion, and fortifying governance systems.

Acknowledgments

The authors would like to thank the students of MBA Environmental Sustainability (S. Patil, N. Sathe, S. Sriram and S. Samant) to help us in data collection for this research work. At the outset, the authors would like to thank the respondents for sparing their precious time for filling up the questionnaire. Without their contribution this research work would not have concluded.

Authors' contribution: A.A. Abhyankar: Introduction, research idea, methodology, resources, and writing-revision; **J.S. Sudarsan:** Conceptualization and data collection, citations and reference; **V. Balon:** Data analysis, interpretation and discussion.

Funding: Not applicable.

Research content: The research presented in this manuscript is original and has not been published elsewhere.

Ethical approval: Not applicable.

Conflict of interest: The authors declare no conflict of interest.

Data availability: Not applicable.

Consent to publish: All authors agree to publish the paper in *Journal of Environmental Biology.*

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